



THE  
ONTARIO WATER RESOURCES  
COMMISSION  
WATER POLLUTION SURVEY  
of the  
COMMUNITIES OF HARROWSMITH AND VERONA  
in the  
TOWNSHIP OF PORTLAND  
in the  
COUNTY OF FRONTENAC  
1968

### Copyright Provisions and Restrictions on Copying:

This Ontario Ministry of the Environment work is protected by Crown copyright (unless otherwise indicated), which is held by the Queen's Printer for Ontario. It may be reproduced for non-commercial purposes if credit is given and Crown copyright is acknowledged.

It may not be reproduced, in all or in part, for any commercial purpose except under a licence from the Queen's Printer for Ontario.

For information on reproducing Government of Ontario works, please contact ServiceOntario Publications at [copyright@ontario.ca](mailto:copyright@ontario.ca)

REPORT

on a

WATER POLLUTION SURVEY

of the

COMMUNITIES OF HARROWSMITH AND VERONA

in the

TOWNSHIP OF PORTLAND

in the

COUNTY OF FRONTENAC

1 9 6 8

DISTRICT ENGINEERS BRANCH

DIVISION OF SANITARY ENGINEERING

COMMUNITIES OF HARROWSMITH AND VERONA

TOWNSHIP OF PORTLAND

INDEX

PAGE NO.

|                                       |   |
|---------------------------------------|---|
| Introduction                          | 1 |
| Interview with Officials              | 1 |
| Communities of Harrowsmith and Verona | 1 |
| Water Uses                            | 2 |
| Surface Water Drainage                | 2 |
| Sanitary Waste Disposal               | 2 |
| Industrial Waste Disposal             | 3 |
| Municipal Refuse Disposal             | 3 |
| Sampling Procedure                    | 4 |
| Sample Results                        | 4 |
| Summary                               | 5 |
| Recommendations                       | 6 |

APPENDICES

|                                                          |
|----------------------------------------------------------|
| Interpretation of Analyses                               |
| Methods of Financing of Municipal Water and Sewage Works |
| Laboratory Results - Tables I II III IV                  |
| Maps of the Communities of Harrowsmith and Verona        |

# ONTARIO WATER RESOURCES COMMISSION

## R E P O R T

### INTRODUCTION

A water pollution survey of the Communities of Harrowsmith and Verona in the Township of Portland was performed during the period of October 13, 1966, to November 20, 1967. Surveys of this type are made by the Ontario Water Resources Commission in order to locate potential and existing sources of water pollution. Recommendations are made concerning the abatement of conditions which adversely affect water quality. Appended to this report are maps of Harrowsmith and Verona showing the location of sampling points as well as the interpretation and significance of laboratory analyses and also methods of financing municipal water and sewage works projects.

### INTERVIEW WITH OFFICIALS

Discussions were held with the following officials:

Mr. S. W. Revell, Reeve

Mr. S. Botting, Clerk-Treasurer

Mr. S. Buck, Local Health Inspector

Several unsuccessful attempts were made to contact Dr. S. E. Rybak, Medical Officer of Health.

### COMMUNITIES OF HARROWSMITH AND VERONA

The Community of Harrowsmith is located on Highway # 38 in Concession V of Portland Township.

The Community of Verona is located on Highway # 38 in Concession XI of Portland Township on the shore of Verona Lake.

#### WATER USES

##### Municipal

Neither Community have a municipal or communal water works. Water supplies are obtained from private wells.

##### Industrial

A large cheese factory located in Harrowsmith employs a well and a spring for its water supply.

#### SURFACE WATER DRAINAGE

Surface run-off in Harrowsmith would drain to Wilton Creek. Run-off from the hamlet of Verona would have access to Vanluven and Verona Lake and also Hardwood Creek in the southern section.

#### SANITARY WASTE DISPOSAL

Individual sub-surface disposal systems are employed in both communities. The Ontario Department of Highways storm sewer construction in Verona revealed waste disposal problems in the north section of the community. During the period of this survey the problem of sanitary wastes in the storm sewer system would appear to have substantially improved.

Reportedly, prior to this survey a concerted effort had been expended in Harrowsmith to correct waste disposal problems. An old bank building located near the creek and housing two

families poses a threat to stream quality due to the limited size of the lot and its proximity to the creek. Upon investigation, should the sewage disposal system prove to be inadequate, one solution to this problem would be the provision of a waste holding tank with haulage of the waste to a suitable site for disposal in a manner that would not jeopardize surface or ground water quality.

#### INDUSTRIAL WASTE DISPOSAL

The waste disposal procedures associated with the Harrowsmith Cheese Factory operation which posed at least an intermittent threat to surface water quality for many years would appear to have been brought under control through the use of a waste holding pond and spray irrigation equipment. A conscientious approach to the operation of this system is to be encouraged.

The above-mentioned firm is the only known wet-process industry in the municipality at this time.

#### MUNICIPAL REFUSE DISPOSAL

A separate disposal site is employed for each community. In both instances garbage and refuse are pushed over a steep embankment where it would be difficult to employ a sanitary land-fill type of operation. Both operations are a potential hazard to surface water quality. Re-location of both sites to an area where water quality could be protected and a satisfactory method of land-fill operation employed is indicated.

## SAMPLING PROCEDURE

Samples were collected from all known sewer outfalls and from pertinent surface water locations as well as from specific ground water supplies.

## SAMPLE RESULTS

The pertinent laboratory analyses results, together with an interpretation of the various analyses employed and separate maps showing the location of sampling points are appended to this report.

The analyses employed in this survey to assess the quality of surface waters and outfall discharges were biochemical oxygen demand (BOD), suspended solids, the most probable Number Total and faecal coliform counts, phenols and Total Kjeldahl as N.

The analyses employed to assess ground water quality included Hardness as  $\text{CaCO}_3$ , Alkalinity as  $\text{CaCO}_3$ , Iron as Fe, Chloride as Cl, PH, Anionic Detergents as ABS, Total Kjeldahl as N, Free Ammonia, Nitrite, Nitrate, Sulphate as  $\text{SO}_4$ , BOD, Total, Suspended and Dissolved Solids.

The sample results are tabulated in the appendices as follows:

Table I - Harrowsmith-Sewer Outfalls and Surface Water Quality

Table II - Harrowsmith-Ground Water Quality

Table III- Verona - Sewer Outfalls

Table IV - Verona - Ground Water Quality



The sample analyses results tend to corroborate a waste disposal problem between the main bridge and the railway bridge, in the vicinity of the watercourse in Harrowsmith. No appreciable flow was noted upstream of the main bridge.

The sample analyses results pertinent to the three sewer outfalls in Verona indicate a substantial improvement over the period of this survey. The stream sample analysis results pertinent to Hardwood Creek in the south end of Verona do not reflect any significant waste disposal problems in that section of the community.

In Harrowsmith, seven wells and a spring show coliform contamination while 12 wells indicated by an asterisk on the analysis sheets revealed a significant concentration of ammonia and/or nitrates. A bacterial sampling of these wells would indicate whether simple disinfection would correct the problem or whether chlorination would be necessary. The high concentration chlorides and sulphates present in some of the wells are characteristic of ground water in this area.

The investigation of ground water quality in Verona did not reveal any significant pollution problems.

#### SUMMARY

A water pollution survey of the communities of Harrowsmith and Verona in the Township of Portland during 1966 and 1967 indicated a localized waste disposal problem in Harrowsmith in the vicinity of the main bridge on Wilton Creek and apparently a

diminishing problem in the illegal use of storm sewers for sanitary waste disposal in Verona. The refuse disposal sites serving both communities are considered a potential hazard to surface water quality. Further investigation of ground water quality in Harrowsmith is necessary in order to establish the extent of pollution.

An obvious ground water pollution problem did not present itself in Verona based on the results of this investigation.

#### RECOMMENDATIONS

1. The municipality should notify the owners of the wells indicated by an asterisk on the analysis sheets as well as those with bacterial counts. The concerned owners can then make arrangements with the local health authority for a future bacterial sampling surveillance of these wells.
2. The waste disposal procedures associated with the old bank building, located on the banks of Wilton Creek, in Harrowsmith, should be investigated by the local health authority.
3. Local officials should give serious consideration to the relocation of both refuse disposal sites to an area where maximum protection can be provided for surface water quality.
4. The appropriate officials should continue to ensure that sanitary waste disposal methods do not include the use of storm sewer systems which are intended for the exclusive purpose of conveying uncontaminated flows.

Prepared By: A. D. McConnell  
A. D. McConnell, Technician  
Division of Sanitary Engineering.

## APPENDIX I

### SIGNIFICANCE OF LABORATORY ANALYSES

#### Bacteriological Examination

The presence of coliforms indicates pollution from human or animal excrement, or from some non-faecal forms. The objectives for surface water quality in Ontario is a maximum of 2400 organisms per 100 millilitres.

The OWRC Laboratories employ the Membrane Filter (MF) technique of examination to obtain a direct enumeration of coliform organisms. The Department of Health Laboratories use the Most Probable Member (MPN) enumeration and coliform counts are reported as Total Coliform Organisms (TC) and Faecal Coliform Organisms (FC).

#### Sanitary Chemical Analyses

##### Biochemical Oxygen Demand (BOD)

Biochemical Oxygen Demand is reported in parts per million (PPM) and is an indicated of the amount of oxygen required for the stabilization of decomposable organic or chemical matter in water. The completion of the laboratory test required five days, under the controlled incubation temperature of 20° Centigrade.

The OWRC objective for surface water quality is an upper limit of four (4) ppm.

##### Solids

The value for solids, expressed in parts per million, is the sum of the values for the suspended and the dissolved matter in the water. The concentration of suspended solids is generally

the most significant of the solids analyses with regard to surface water quality. The effects of suspended solids in water are reflected in difficulties associated with water purification, decomposition in streams and injury to the habitat of fish.

### Nitrogen

Ammonia Nitrogen or sometimes called free ammonia is the insoluble product in the decomposition of nitrogenous organic matter. It is also formed when nitrates and nitrites are reduced to ammonia either biologically or chemically. Some small amounts of ammonia, too, may be swept out of the atmosphere by rain water.

The following values may be of general significance in appraising free ammonia content: Low 0.015 to 0.03 ppm; moderate 0.03 to 0.10 ppm; high 0.10 or greater.

Total Kjeldahl is a measure of the total nitrogenous matter present except that measured as nitrite and nitrate nitrogens. The Total Kjeldahl less the Ammonia Nitrogen measures the organic nitrogen present. Ammonia and organic nitrogen determinations are important in determining the availability of nitrogen for biological utilization. The normal range for Total Kjeldahl would be 0.1 to 0.5 ppm.

### Nitrite Nitrogen

Nitrite is usually an intermediate oxidation of ammonia. The significance of nitrites, therefore, varies with their amount, sources, and relation to other constituents of the

sample, notably the relative magnitude of ammonia and nitrite present. Since nitrite is rapidly and easily converted to nitrate, its presence in concentrations greater than a few thousandths of a part per million is generally indicative of active biological processes in the water.

#### Nitrate Nitrogen

Nitrate is the end product of aerobic decomposition of nitrogenous matter, and its presence carries this significance. Nitrate concentration is of particular interest in relation to the other forms of nitrogen that may be present in the sample. Nitrates occur in the crust of the earth in many places and are a source of its fertility.

The following ranges in concentration may be used as a guide: low less than 0.1 ppm; moderate 0.1 to 1.0 ppm; high greater than 1.0 ppm.

#### Anionic Detergents as ABS

The presence of anionic detergents as ABS is an indication that domestic waste is present.

#### Phenols

The presence of phenol or phenolic equivalents is generally associated with discharges containing petroleum products, or with wastes from some industries. It is generally conceded that adequate protection of surface waters will be provided if the concentration of phenols in waste discharges does not exceed

20 parts per billion (ppb). Phenolic type waste can cause objectionable conditions in water supplies and might taint the flesh of fish.

Iron

Water for domestic use should contain less than 0.3 parts per million of iron in order to avoid objectionable tastes, staining and sediment formation. Iron concentrations of not greater than 17 parts per million in waste discharges should permit adequate protection of surface waters.

## APPENDIX

### IMPLEMENTATION OF WATER AND SEWAGE WORKS PROGRAMS

Currently, there are three general methods which may be utilized for implementing sewage and water works programs. These are: 1) to enter into an agreement with the OWRC for the construction of the treatment and collector works with an obligation to pay the debt retirement and operating charges over the term of the agreement with the facility reverting to the municipality at the end of the term of the agreement, 2) by requesting the provision of service from a Provincially-owned project, and 3) by proceeding with the construction independently and meeting capital costs by the sale of debentures.

#### OWRC/MUNICIPAL PROJECTS

For the construction of water and sewage works under agreement with this Commission, the works are provided and developed under Sections 39 to 46 of the Ontario Water Resources Commission Act.

For this type of arrangement, the Commission utilizes a sinking fund and consequently the annual payments are based on a specific debt retirement period and the payments are unchanged for the period of the agreement. This type of project may be financed over a period of time up to a maximum of thirty years. The annual charges for projects constructed under this agreement are determined as follows:

##### 1. Capital Repayment

As noted, OWRC financing is by the sinking fund method and an annual payment of approximately 2 per cent of the capital

cost is required to retire a debt over a thirty-year period.

2. Interest

On new Commission projects, interest is calculated at the current rate.

3. Reserve Fund

To provide money for repairs and replacements, Section 40 of The Ontario Water Resources Commission Act provides for the establishment of a reserve fund by the Commission. It is important to note that this fund is established in the name of the municipality and the balance consequently earns interest. It has now been established by Commission minute that the reserve fund billing for each project shall continue only until the fund reaches an amount of ten times the initial annual billing and the reserve fund billing shall be re-imposed only when the fund has been depleted to 80 per cent or less of the maximum amount.

4. Operating Costs

Under OWRC agreement, the municipality is responsible only for the operating costs directly attributed to the project in the municipality. Therefore, no charges are made by the Commission for the services of head office personnel who are available as required to advise on the satisfactory operation and maintenance of the project.



PROVINCIALY-OWNED WORKS

In June, 1967, the Honourable J. R. Simonett, Minister of Energy and Resources Management, made an announcement which expanded the authorization of this Commission for the provision of water supply and sewage treatment facilities. This new program allows the Commission to construct entire water and sewage works facilities for small municipalities. The capital costs of these can be amortized over a 40 year period.

A slight variation of this program could be implemented in that the municipality may request that this Commission provide only the major water and sewage works facilities as Provincially-owned works, and develop the water distribution and sewage collector systems under the standard type of Commission project. It would appear that where applicable, it would be more advantageous for the municipality to proceed on the basis of requesting this Commission to develop entire systems as Provincially-owned works.

The associated cost of supplying these works, including amortization of capital costs, together with operating and maintenance charges, will be recovered by the sale of service to the affected municipalities by rates determined on a usage basis. These facilities will be wholly-owned by the Province of Ontario and the arrangements for service will be formalized by contracts between the Commission and the municipality concerned. The installations will be operated entirely at cost with appropriate provision for adjustment in rate.

DEVELOPMENT

If a municipality, after considering the alternatives, wishes this Commission to consider Provincially-financed projects, application forms should be completed and submitted together with a resolution of the Municipal council. A draft of the suggested wording of the resolution is included with the application forms.

If the proposed works are to be built by the municipality on its own initiative or as a formal project under agreement with this Commission, it is required that the Council retain a consulting engineer to prepare preliminary engineering reports on the proposed work. If a Provincial system is contemplated, no action should be taken with respect to retaining a consulting engineering firm as the Commission will designate a consulting engineer to carry out the Provincial portion of the work and it would be advantageous if the municipal portion be studied and reported on by the same engineer.

TABLE I

COMMUNITY OF HARROWSMITH - TOWNSHIP OF PORTLAND

Date Sampled: 13/10/66

| 5-Day<br>BOD | S O L I D S |       |       | N I T R O G E N    A S    N |                   |         |         | Anionic<br>Detergents<br>as ABS | BACTERIOLOGICAL EXAMINATION |        |
|--------------|-------------|-------|-------|-----------------------------|-------------------|---------|---------|---------------------------------|-----------------------------|--------|
|              | Total       | Susp. | Diss. | Free<br>Ammonia             | Total<br>Kjeldahl | Nitrite | Nitrate |                                 | Total<br>Coliforms          | E.Coli |
| 1.6          | 734         | 9     | 725   | 0.62                        | 1.70              | 0.10    | 2.50    | 0.1                             | 1100                        | 0      |
| 2.4          | 926         | 20    | 906   | 2.30                        | 6.60              | 0.20    | 2.00    | 1.1                             | 240,000 +                   | 240    |

1.        Ottawa street storm sewer outfall to creek.    WH 17.01 W
2.        Local creek at railroad tracks.    WH 17.0

TABLE II

## HARROWSMITH - WELLS - TOWNSHIP OF PORTLAND

Date Sampled: 13/10/66

| 5-Day<br>BOD | S O L I D S |       |       | N I T R O G E N |                   | A S     | N       | SULPHATE              | CHLORIDE  | BACTERIOLOGICAL<br>EXAMINATIONS |         |
|--------------|-------------|-------|-------|-----------------|-------------------|---------|---------|-----------------------|-----------|---------------------------------|---------|
|              | Total       | Susp. | Diss. | Free<br>Ammonia | Total<br>Kjeldahl | Nitrite | Nitrate | as<br>SO <sub>4</sub> | as<br>Cl. | Total<br>Coliforms              | E. Coli |
| **           | 464         | **    | **    | 0.03            | 0.40              | 0.00    | 2.00    | 56                    | 53        | 0                               | 0       |
| 0.3          | 466         | **    | **    | 0.03            | 0.33              | 0.20    | 1.40    | 73                    | 48        | 0                               | 0       |
| 0.3          | 856         | **    | **    | 0.36            | 0.91              | 0.00    | 0.00    | 69                    | 189       | 0                               | 0       |
| 0.9          | 558         | **    | **    | 0.10            | 0.33              | 0.00    | 0.00    | 17                    | 56        | ---                             | 39      |
| 0.3          | 876         | **    | **    | 0.02            | 0.84              | 0.00    | 0.00    | 61                    | 146       | 2.2                             | 0       |
| 0.6          | 834         | **    | **    | 0.26            | 0.58              | 0.00    | 0.00    | 115                   | 144       | 0                               | 0       |
| 0.3          | 968         | **    | **    | 0.02            | 0.71              | 0.01    | 2.40    | 90                    | 220       | ---                             | 8.9     |
| 0.4          | 658         | **    | **    | 0.02            | 0.40              | 0.00    | 0.00    | 123                   | 135       | 0                               | 0       |
| 0.7          | 1108        | **    | **    | **              | **                | 0.04    | 2.40    | 179                   | 185       | 0                               | 2.0     |

\*\* Sample exhausted - Test could not be performed

1. Harrowsmith Public School - West Building. -well \*
2. Premises of Mr. Harold Lambert. - well \*
3. Meeks Lumber Co. - well \*
4. Mr. Cecil Dillon's Well.\*
5. St. Patrick's School Well.
6. Mr. Fred Woodcock Well. \*
7. MacRae's Service Station. - well \*
8. Mr. Wilkins Kennedy.- well
9. Mr. Allen Thompson. - well \*

\* High ammonia and/or nitrate content

TABLE II (CONT'D)

COMMUNITY OF HARROWSMITH WELL SUPPLIES - TWP. OF PORTLAND

| 5-Day<br>BOD | S O L I D S |       |       | N I T R O G E N |                   | A S     | N       | SULPHATE<br>as<br>SO <sub>4</sub> | CHLORIDE<br>as<br>Cl. | BACTERIOLOGICAL<br>EXAMINATIONS |         |
|--------------|-------------|-------|-------|-----------------|-------------------|---------|---------|-----------------------------------|-----------------------|---------------------------------|---------|
|              | Total       | Susp. | Diss. | Free<br>Ammonia | Total<br>Kjeldahl | Nitrite | Nitrate |                                   |                       | Total<br>Coliforms              | E. Coli |
| 0.7          | 784         | 2     | 782   | 0.02            | 0.52              | 0.03    | 2.50    | 91                                | 141                   | 0                               | 0       |
| 0.4          | 782         | 3     | 779   | 0.36            | 0.91              | 0.00    | 0.00    | 111                               | 148                   | 5                               | 0       |
| 0.5          | 840         | 6     | 834   | 0.03            | 0.71              | 0.00    | 0.50    | 199                               | 147                   | 5                               | 0       |
| 0.5          | 586         | **    | **    | 0.02            | 0.71              | 0.00    | 7.50    | 57                                | 48                    | 0                               | 0       |
| 0.2          | **          | **    | **    | **              | **                | 0.00    | **      | 425                               | 428                   | 0                               | 0       |
| 0.3          | 442         | **    | **    | 0.36            | 0.91              | 0.00    | **      | 52                                | 44                    | 0                               | 0       |

\*\* Sample exhausted - test could not be performed

10 H. L. Gallagher - well \*

11 Sportsman Restaurant - well \*

12 Harold Walker - well

13 Floyd Clark - well \*

14 J. Braithwaite - well

15 L. Husband - well \*

\* high ammonia and/or nitrate content

TABLE II (CONT'D)

COMMUNITY OF HARROWSMITH - TOWNSHIP OF PORTLAND

Date Sampled: 13/10/66

| 5-Day<br>BOD | S O L I D S  |              |              | N I T R O G E N    A S    N |                           |                |                | SULPHATE                     | CHLORIDE         | BACTERIOLOGICAL<br>EXAMINATION |               |
|--------------|--------------|--------------|--------------|-----------------------------|---------------------------|----------------|----------------|------------------------------|------------------|--------------------------------|---------------|
|              | <u>Total</u> | <u>Susp.</u> | <u>Diss.</u> | <u>Free<br/>Ammonia</u>     | <u>Total<br/>Kjeldahl</u> | <u>Nitrite</u> | <u>Nitrate</u> | <u>as<br/>SO<sub>4</sub></u> | <u>as<br/>Cl</u> | <u>Total<br/>Coliforms</u>     | <u>E.Coli</u> |
| ---          | ---          | ---          | ---          | ---                         | ---                       | ---            | ---            | ---                          | ---              | 0                              | 0             |
| ---          | ---          | ---          | ---          | ---                         | ---                       | ---            | ---            | ---                          | ---              | 0                              | 39            |
| 2.2          | 1914         | **           | **           | 0.30                        | 0.71                      | 0.00           | **             | 634                          | 374              | 15                             | 0             |
| 1.0          | 948          | **           | **           | 0.02                        | 0.52                      | 0.01           | 0.24           | 131                          | 167              | 0                              | 0             |

\*\* Sample exhausted - test could not be performed

- 16 Harrowsmith Public School - well
- 17 Harrowsmith Cheese Factory - spring
- 18 Harrowsmith Cheese Factory - well       \*
- 19 Harold Day Residence - well

\* high ammonia and/or nitrate content

TABLE III

COMMUNITY OF VERONA - TOWNSHIP OF PORTLAND

| <u>DATE</u> | <u>SAMPLE<br/>POINT<br/>No.</u> | <u>5-Day<br/>BOD</u> | <u>S O L I D S</u> |              |              | <u>Anionic<br/>Detergents<br/>as ABS</u> | <u>Phenols<br/>in ppb.</u> | <u>Total<br/>Kjeldahl<br/>as N</u> | <u>BACTERIOLOGICAL EXAMINATION</u> |                             |
|-------------|---------------------------------|----------------------|--------------------|--------------|--------------|------------------------------------------|----------------------------|------------------------------------|------------------------------------|-----------------------------|
|             |                                 |                      | <u>Total</u>       | <u>Susp.</u> | <u>Diss.</u> |                                          |                            |                                    | <u>Total<br/>Coliforms</u>         | <u>Faecal<br/>Coliforms</u> |
| 11/2/66     | A                               | 14.0                 | 354                | 134          | 220          | 0.3                                      | 20                         | 1.70                               | 240,000 +                          | 240,000 +                   |
| 10/18/67    |                                 | 5.0                  | 174                | 59           | 115          | 0.06                                     | 20                         |                                    | 190,000                            | 800                         |
| 11/20/67    |                                 | 5.6                  | 786                | 5            | 781          |                                          |                            |                                    | 320                                | 12                          |
| 11/2/66     | B                               | 18.0                 | 306                | 112          | 194          | 0.3                                      |                            | 1.70                               | 240,000 +                          | 46,000                      |
| 10/18/67    |                                 | 7.2                  | 112                | 56           | 56           | 0.06                                     |                            |                                    | 320,000                            | 2,800                       |
| 11/20/67    |                                 | 3.1                  | 760                | 9            | 751          |                                          |                            |                                    | 35                                 | 6                           |
| 11/2/66     | C                               | 45.0                 | 402                | 262          | 140          | 0.4                                      |                            | 1.70                               | 24,000 +                           | 24,000 +                    |
| 10/18/67    |                                 | 6.0                  | 226                | 50           | 176          | 0.06                                     | 8                          |                                    | 69,000                             | 15,000                      |
| 11/20/67    |                                 | 4.4                  | 1172               | 33           | 1139         |                                          |                            |                                    | 105                                | 2                           |
| 11/2/66     | NCH 31.6                        | 2.1                  | 200                | 21           | 179          |                                          |                            |                                    | 9.1                                | 9.1                         |
| 10/18/67    |                                 | 1.8                  | 154                | 3            | 151          | 0.06                                     |                            |                                    | 240                                | 70                          |

A     Sewer outfall north of Pentecostal Church

B     Sewer outfall to Rock Lake

C     Sewer outfall at south end of hamlet to swamp

NCH 31.6   Hardwood Creek at Highway #38

TABLE IV

HAMLET OF VERONA - TOWNSHIP OF PORTLAND

Date Sampled: Nov. 2/66

| <u>Hardness</u><br><u>as CaCO<sub>3</sub></u> | <u>Alkalinity</u><br><u>as CaCO<sub>3</sub></u> | <u>Iron</u><br><u>as Fe</u> | <u>Chloride</u><br><u>as Cl</u> | <u>pH at</u><br><u>Lab</u> | <u>Apparent</u><br><u>Colour</u><br><u>Units</u> | <u>Turbidity</u><br><u>Units</u> | <u>Anionic</u><br><u>Detergents</u><br><u>as ABS</u> | <u>Total</u><br><u>Kjeldahl</u><br><u>as N</u> | <u>BACTERIOLOGICAL</u><br><u>EXAMINATION</u> |               |
|-----------------------------------------------|-------------------------------------------------|-----------------------------|---------------------------------|----------------------------|--------------------------------------------------|----------------------------------|------------------------------------------------------|------------------------------------------------|----------------------------------------------|---------------|
|                                               |                                                 |                             |                                 |                            |                                                  |                                  |                                                      |                                                | <u>Total</u><br><u>Coliforms</u>             | <u>E.Coli</u> |
| 570                                           | 348                                             | 0.50                        | 101                             | 7.5                        |                                                  |                                  | 0.0                                                  | 0.20                                           | 0                                            | 0             |
| 490                                           | 348                                             | 0.79                        | 66                              | 7.5                        |                                                  |                                  | 0.0                                                  | 0.33                                           | 0                                            | 0             |
| 312                                           | 260                                             | 0.28                        | 32                              | 7.6                        |                                                  |                                  | 0.0                                                  | 0.07                                           | 0                                            | 0             |
| 298                                           | 239                                             | tr.*                        | 56                              | 7.8                        |                                                  |                                  | 0.0                                                  | 0.07                                           | 0                                            | 0             |
| 580                                           | 301                                             | 0.15                        | 247                             | 7.5                        |                                                  |                                  | 0.0                                                  | 0.07                                           | 0                                            | 0             |

\* Less than 0.005 ppm

Well #1. - Gene Ruth Restaurant  
 Well #2. - Lou's Lunch  
 Well #3. - Preston's Restaurant  
 Well #4. - Prince Charles Public School  
 Well #5. - Mrs. Hazel McEwan







